

# **2010 9th Euro-American Workshop on Information Optics (WIO 2010)**

**Helsinki, Finland  
12 – 16 July 2010**



**IEEE Catalog Number: CFP1077K-PRT  
ISBN: 978-1-4244-8226-9**

# TABLE OF CONTENTS

<b>Nanophotonics for Information Systems</b> .....	1
<i>Y. Fainman, A. Simic, O. Bondarenko, B. Slutsky, A. Mizrahi, M. Nezhad</i>	
<b>Single Beam Computational 3D Microscopy</b> .....	3
<i>A. Anand, B. Javidi</i>	
<b>Compressive Imaging for Superresolution From a Single Exposure</b> .....	6
<i>A. Stern, Y. Rivenson, B. Javidi</i>	
<b>Optical Devices for Label-free Detection</b> .....	8
<i>A. M. Armani, H. K. Hunt, H. S. Hsu, H. S. Choi</i>	
<b>Miniaturized Spectrometer Technologies</b> .....	10
<i>J. Antila</i>	
<b>A 180-nm CMOS Time-of-Flight 3-D Image Sensor</b> .....	14
<i>G. F. D. Betta, S. Donati, G. Martini, L. Pancheri, D. Stoppa, G. Verzellesi</i>	
<b>Chromatic Sharing a Binary Secret within a Host Image</b> .....	17
<i>T. Fournel</i>	
<b>3D Wave Field Reconstruction from Intensity-only Data: Variational Inverse Imaging Techniques</b> .....	19
<i>V. Katkovnik, A. Migukin, J. Astola</i>	
<b>Capture, Processing, and Display of Real-world 3D Objects using Digital Holography</b> .....	22
<i>T. J. Naughton, C. Falldorf, L. Onural, P. Ferraro, C. Depeursinge, S. Krueger, Y. Emery, B. M. Hennelly, M. Kujawinska</i>	
<b>3D Holographic Video Content Capture, Manipulation and Display Technologies</b> .....	25
<i>A. Aggoun</i>	
<b>Displaying Digital Holograms of Real-world Objects on a Mobile Device Using Tilt-based Interaction</b> .....	28
<i>T. M. Lehtimäki, K. Saaskilahti, M. Kowiel, T. J. Naughton</i>	
<b>Liquid Crystal Spatial Light Modulators in Optical Metrology</b> .....	31
<i>C. Falldorf, C. von Kopylow, R. B. Bergmann</i>	
<b>Exploring Shot Noise and Laser Doppler Imagery with Heterodyne Holography</b> .....	34
<i>M. Gross, F. Verpillat, F. Joud, M. Atlan</i>	
<b>Invisibility Cloaking in Weak Scattering</b> .....	37
<i>T. Setälä, T. Hakkarainen, A. T. Friberg, B. J. Hoenders</i>	
<b>On Feasibilities of the Use of Spatial Polarization Modulation for Estimating Coherence of Optical Fields</b> .....	39
<i>O. V. Angelsky</i>	
<b>Methods for Modeling Nonparaxial Fields</b> .....	42
<i>J. C. Petruccioli, N. J. Moore, M. A. Alonso</i>	
<b>Fractal Diffraction and Focusing Properties of Binary Phase Gratings</b> .....	44
<i>K. H. Brenner, R. Buschlinger</i>	
<b>Diffraction Control of Femtosecond Pulses</b> .....	47
<i>O. Mendoza-Yero, G. Miguez-Vega, E. Tajahuerce, J. Lancis, C. Romero, B. Alonso, R. Borrego-Varillas, O. Varela, V. Lorient, R. de Nalda, L. Banares</i>	
<b>SRS Microscopy as a Low-Invasive 3D Bioimaging Technique</b> .....	50
<i>K. Itoh, Y. Ozeki</i>	
<b>Spectral Interferometry for the Characterization of Ultra-short Light Pulses: SPIRIT Wideband</b> .....	53
<i>L. Martinez-Leon, T. Mansuryan, M. Kalashyan, F. Louradour, A. Barthelemy</i>	
<b>Reconfigurable Holographic Lithography for Photonic Structure Fabrication</b> .....	56
<i>J. Xavier, J. Joseph, C. Denz</i>	
<b>Qualities of 3-D Images</b> .....	59
<i>J. Y. Son, M. C. Park</i>	
<b>The Information Content of Aberrated- and Non Aberrated Images Generated by Coherently- or Incoherently Illuminated Objects</b> .....	63
<i>B. J. Hoenders</i>	
<b>Current Status of Ultra-Realistic Communication Research in NICT</b> .....	66
<i>N. Inoue</i>	
<b>Progress and Perspectives in Digital Holographic Microscopy Applied to Life Sciences</b> .....	68
<i>P. Marquet, J. Kuhn, D. Boss, P. Jourdain, P. Magistretti, N. Pavillon, C. Depeursinge</i>	
<b>Application of Optical Trapping for Detection of Calcium Induced Morphological Changes of Red Blood Cells</b> .....	72
<i>A. R. Moradi, M. K. Ali, M. Daneshpanah, A. Anand, B. Javidi</i>	

<b>Information Optics in Biophotonics</b> .....	75
<i>J. Gluckstad</i>	
<b>Maximizing Signal-to-noise-ratio in Extended Depth-of-field Bio-imaging</b> .....	79
<i>S. Bagheri</i>	
<b>Some Features of Temporal Ghost Imaging with Classical Light</b> .....	81
<i>T. Shirai, T. Setala, A. T. Friberg</i>	
<b>Efficient Compressive Fresnel Holography</b> .....	83
<i>A. Stern, Y. Rivenson, B. Javidi</i>	
<b>Robust Information Extraction in Interferometry: Overview and Applications</b> .....	85
<i>M. Sjudahl</i>	
<b>Single-Exposure Digital Holography by a Generalized Wave-Splitting Phase-Shifting Method</b> .....	88
<i>T. Nomura</i>	
<b>Diffractive Optics for High-Resolution Low-Coherence Digital Holography</b> .....	91
<i>R. Martinez-Cuenca, L. Martinez-Leon, P. Andres, P. Clemente, J. Lancis, G. Minguez-Vega, O. Mendoza-Yero, E. Tajahuerce</i>	
<b>Different Approaches to Increase Resolution in DHM</b> .....	94
<i>A. Faridian, D. Hopp G. Pedrini, W. Osten, U. Eigenthaler, M. Hirscher</i>	
<b>Temporal Double- and Triple-Intensity Correlation Imaging with Classical Light</b> .....	97
<i>H. Kellock, T. Setala, A. T. Friberg, T. Shirai</i>	
<b>Levitation of Colloidal Particles on an Evanescent Optical Wave</b> .....	100
<i>R. Khakimov, A. Shevchenko, A. Havukainen, K. Lindfors, M. Kaivola</i>	
<b>Design and Fabrication of Plasmonic Nanostructures for Spectroscopic Applications</b> .....	102
<i>A. Kravchenko, R. Khakimov, A. Shevchenko, A. Priimagi, M. Kaivola, V. Ovchinnikov</i>	
<b>Evaluation of Perceived Quality Attributes of Digital Holograms Viewed with a Stereoscopic Display</b> .....	104
<i>T. M. Lehtimaki, K. Saaskilahti, T. Pitkaaho, T. J. Naughton</i>	
<b>Digital Fresnel Hologram Watermarking</b> .....	107
<i>N. K. Nishchal, T. Pitkaaho, T. J. Naughton</i>	
<b>Partial Spatial Coherence and Polarization in Purely Evanescent Electromagnetic Fields</b> .....	110
<i>A. Norman, T. Setala, A. T. Friberg</i>	
<b>3D Perception of Numerical Hologram Reconstructions Enhanced by Motion and Stereo</b> .....	113
<i>R. Nasanen, T. Colomb, Y. Emery, T. J. Naughton</i>	
<b>Numerical Reconstruction of Digital Holograms for Conventional 3D Display</b> .....	116
<i>T. Pitkaaho, T. J. Naughton</i>	
<b>The Interconnection Between the Corrdinate Distribution of Muller-Matrixes Images Characteristics Values of Biological Liquid Crystals Net and the Pathological Changes of Human Tissues</b> .....	119
<i>A. G. Ushenko, Y. A. Ushenko, Y. Y. Tomka, O. V. Dubolazov, O. Y. Telenga, V. I. Istratiy, A. O. Karachevtcev</i>	
<b>Regularized Reconstruction of Irregularly Sampled Scalar Light Fields</b> .....	122
<i>V. Uzunov, A. Gotchev, K. Egiazarian</i>	
<b>Polarization Dynamics of Random 3D Light Fields</b> .....	125
<i>T. Voipio, T. Setala, A. Shevchenko, A. T. Friberg</i>	
<b>About Methods of Estimating the Correlation Properties of Circularly-Polarized and Linearly-Polarized Plane Waves</b> .....	128
<i>O. V. Angelsky, C. Y. Zenkova, M. P. Gorsky, N. V. Gorodys'ka</i>	
<b>Author Index</b>	